Primary Care Management of Attention Deficit / Hyperactivity Disorder

B. Paul Choate, M.D.

Introduction

- 5% of girls, 10% of boys of elementary age
- Chronic neurobehavioral disorders characterized by varying combinations of:
  - Inability to inhibit behavior (impulsivity)
  - Inability to function in goal-oriented activity (inattention)
  - Inability to regulate activity (hyperactivity)

Introduction

- Etiology is multifactorial
  - Strong evidence for genetic predisposition
- Comorbidity is common
- Symptoms emerge in childhood and may persist into adulthood

Introduction

- AD / HD has been described with various terminology for at least 100 years
- Current accepted diagnostic criteria (DSM-IV) describes three subtypes:
  - Predominantly inattentive
  - Predominantly hyperactive / impulsive
  - Combined

Introduction

- Symptoms must have persisted for more than 6 months and some symptoms must have emerged prior to age 7
- Functioning impaired in two or more settings (home, school, with peers)

	Inattention Scale (Scale A)	Never	Sometimes	Often	Very Often
1.	Fails to pay close attention to details or makes careless mistakes in schoolwork, chores, or other tasks				
2.	Has difficulty sustaining attention to tasks, chores, or activties				
3.	Does not seem to listen when spoken to directly				
4.	Does not follow through or instructions and fails to finish schoolwork, chores, or duties (not due to oppositional behavior or failure to understand directions)				
5.	Has difficulty organizing tasks and activities				
6.	Avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork)				
7.	Loses things necessary for tasks or activities (eg. toys, school assignments, pencils, books, or tools)				
8.	Is distracted by unimportant stimuli				
9.	Is forgetful in daily activities				

	Hyperactivity-Impusivity Scale (Scale B)	Never	Sometimes	Often	Very Often
10.	Fidgets with hands or feet or squirms in seat				
11.	Leaves seat in classroom or in other situations when expected to remain seated				
12.	Runs about or climbs excessively in situations where it is inappropriate (in adolescence, may be limited to restlessnes)				
13.	Has difficulty playing or engaging quietly in leisure activities				
14.	Is "on the go" or often acts as if "driven by a motor"				
15.	Talks excessively				
16.	Blurts out answers before the questions have been completed				
17.	Has difficulty awaiting turn				
18.	Interrupts or intrudes on others (eg, butts into others conversations or games)				

	Social - Adaptive Scale (Scale C)	Never	Sometimes	Often	Very Often
19.	Is uncooperative or defiant or argues with adults				
20.	Has difficulty getting along with other children				
21.	Is often angry, irritable, or easily upset				
22.	Has excessive anxiety, worry, or fearfulness				
23.	Seems sad, moody, depressed, or discouraged				
24.	Has problems with academic progress (skill level or learning)				
25.	Has problems with academic performance (productivity or accuracy)				

Differential Diagnosis

Developmental Differences	Medical Disorders
• Normal variation • Cognitive impairment • Giftedness • Learning disabilities • Perceptual/processing disorders • Language disorders • Pervasive developmental disorders • Fragile X syndrome	• Sensory impairments • Seizure disorders • Sequelae of central nervous system infection/trauma • Fetal alcohol syndrome • Lead poisoning • Iron deficiency anemia • Neurodegenerative disorders • Tourette syndrome • Thyroid disorders • Substance abuse • Medication side effect • Undernutrition • Sleep disorder

Differential Diagnosis

Emotional/Behavioral Disorder • Depression/Mood disorders • Anxiety disorders • Oppositional defiant disorder • Conduct disorder • Post-traumatic stress disorder • Adjustment disorder	**Environmental Disorders** • Child abuse/neglect • Stressful home environment • Inadequate/punitive parenting • Parental psychopathology • Sociocultural difference • Inappropriate educational setting
Frequently Associated Problems • Motor coordination disorders • Social skills deficit • Enuresis and encopresis	

Assessment - History

- Parent interview
  - History of core symptoms and related disorders
    - Include *concurrence* between school and home
  - Medical history
  - Developmental history
  - School history
    - Remedial or special education, retention
    - Development of academic skills
    - Classroom functioning

Assessment - History

- Parent interview, continued
  - Psychosocial history
    - Temperament, personality
    - Current emotional status
    - Relationship with parents, adults
    - Relationships with siblings, peers
    - Sociocultural setting and stresses
    - Current management strategies

Assessment - History

- Parent interview, continued
  - Family history
    - AD / HD
    - Behavior disorders
    - School or learning disorders
    - Medical disorders (Tourette’s or other tic disorders, cardiac or thyroid disorders)

Assessment - Physical

- Interview and observe patient
  - Structure of office setting may conceal symptoms
- Physical exam / neurological exam
  - “Soft” neurologic findings
- Developmental observations

Assessment – Laboratory Studies

- Usually not indicated
- Guided by past medical or family history, or physical findings
- Examples: thyroid studies, EEG
- Consider serum lead levels and hematocrit in pre-school children

Assessment – School Data

- Evaluate present skills
  - Report cards
  - Drawings, penmanship
- Seek teachers comments and observations
- Behavior rating scales (ACTeRs, Conners)
- Review IEP testing
  - IQ testing (WISC-IV) and achievement tests
  - May require some pressure

Assessment - Ancillary

- Some additional evaluation may be warranted based on history or physical
  - Speech / language evaluation
  - Occupational therapy evaluation
  - Mental health evaluation

Management

- Team approach
  - Patient
  - Family
  - Physician
  - Teachers
  - Other school personnel including psychologist, special ed. director, etc.

Management

- BEAM approach
  - Behavioral needs
  - Emotional needs
  - Academic needs
  - Medical needs

Management

- Goals
  - Establish the team concept (child, parents, physician, school, other professionals)
  - Educate the child, family, and school about the child's manifestation of AD/HD and related problems
  - Consider behavioral, emotional, academic, and medical issues (BEAM)

Management

- Medication
  - Proven to be of short-term benefit
  - No data to confirm better long-term outcome
  - Medication should not be the sole intervention
  - Medication should not be the “treatment of last resort”
  - Medication should not be continued unless clear-cut benefit is documented

Management

- Education
  - Parents and patients must understand that they did not *cause* this disorder, but they are responsible for its *management*
  - Dispense information as handouts, pamphlets
  - Be prepared to suggest additional resources (see handout – “RESOURCES AND REFERENCES”)

Management

- Counseling
  - Be familiar with local resources
    - School therapist / psychologist
    - Community mental health professionals
    - Parent support groups
  - Parents may need training in behavior modification

Management

- Counseling
  - Parents and teachers must understand that difficult-to-manage behavior is neurologically based
  - Negativism, oppositional behavior, emotional over-reactivity can become a vicious cycle and early intervention with therapy may be warranted

Management

- Basic management:
  - Increased structure
  - Clear directions
  - Developmentally appropriate demands
- Target a limited number of behaviors
- Provide prompt feedback in the form of positive or negative consequences
- Provide consistency between home and school, other settings

Management

- Emotional interventions:
  - “Reframing”
    - Substitute the idea that patient “has a lot of energy that needs to be better directed” for “hyperactive”
  - Competency and social development
    - Recreation and sports (karate)
  - Therapy (individual, family)
    - Especially for secondary behavior problems
  - Support groups

Management

- Academic interventions:
  - Evaluation for learning disability is essential
    - At least 25%, and up to 70% of AD / HD patients have comorbid learning disability
  - Special education resources for some patients
    - Tutoring
    - Resource room
    - Self-contained classroom
    - Speech/language therapy

Management

- Academic interventions, continued
  - Classroom modifications, educational accommodations
  - Mandated by federal law (PL 92-142)
    - AD / HD is considered a “disability”
    - May qualify for additional services under the “Other Health Impaired” category

Management

Classroom modification
Provide a structured learning environment
Repeat and simplify instructions about in-class and homework assignments
Supplement verbal instructions with visual instructions
Use behavior management techniques (eg, daily report cards)
Adjust class schedules
Modify test delivery (extended time, less distracting setting)
Use tape recorders, computer-aided instruction, and other audiovisual equipment

Management

Classroom modification, continued
Select modified textbooks or workbooks
Tailor homework assignments
Consult special resources
Use one-on-one tutorials
Provide classroom aides and note takers
Involve "services coordinator" to oversee implementation
Modify nonacademic times such as lunchroom, recess, and physical education

Management

- Medication
  - Indicated when academic, behavioral, or social function is significantly impaired
  - Parents, teachers, and patients may have unrealistic expectations OR unrealistic fears of medication
  - Psychostimulants (in the amphetamine family) are the first-line medications for AD / HD

Management

- Stimulants
  - Extensively studied since 1937
  - Use has tripled in recent years
  - Methylphenidate (Ritalin®, Concerta™) is most-prescribed
  - Dextroamphetamine (Dexedrine®) may be better in some patients

Management

- Stimulants, continued
  - Mixed salts (Adderall®)
  - Pemoline (Cylert®)
- Generally all of these drugs block catecholamine reuptake (dopamine, norepinephrine, or serotonin to various degrees) and/or release cytoplasmic dopamine

Management

- Ritalin® is available in short (2-4 hour) and long (4-6 hour) dosage forms
- Concerta™ (also methylphenidate) is a new smooth-release, ultra long-acting (10-12 hour) dosage form
- Dexedrine® is also available as a short (3-5 hour) and long (5-8 hour) forms
- Adderall® is a mid-duration (4-6 hour) med

Management

- Dosage
  - Starting dose of methylphenidate is 0.3-0.6 mg/kg/dose
  - Dose for Dexedrine is half (0.1-0.3 mg/kg/dose)

Management

- Effects of stimulants
  - Significant *short term* benefit has been demonstrated in 70-80% of patients
  - With alternative stimulants and a wide-range of doses are tried, response increases to 85-90%
  - Improvement in long-term outcome has not been demonstrated

Management

- Side-effects of stimulants
  - Anorexia
  - Insomnia
  - Stomach aches
  - Headaches
  - Irritability
  - “Rebound”

Management

- Side-effects of stimulants, continued
  - Flattened affect
  - Social withdrawal
  - Weepiness
  - Tics
  - Weight loss
  - Reduced growth velocity

Management

- Medication trial – dose titration
  - Open trial (non-blinded)
  - AM / PM trial
  - Frequent follow-up, dose adjustment
  - School-day only verses every-day medication
  - Comparison behavior scales

Management

- Alternative medications
  - Tricyclic antidepressants
    - Imipramine, desipramine, nortriptyline
    - Efficacy of 60-70%
    - Useful for comorbid depression, anxiety, tic disorder
    - 6 cases of sudden death reported (family history and normal QTc should be documented)
    - Parents need to be advised of risk

Management

- Alternative medications, continued
  - Bupropion (Wellbutrin®) shows modest efficacy for hyperactivity, may do more for aggressive behavior
  - SSRI's have shown little efficacy
  - Recent interest in venlafaxine (Effexor®)

Management

- Alternative medications, continued
  - Clonidine (Catapres®) is an antihypertensive drug with benefit in up to 50% of patients
    - Best for children who are over-aroused, easily frustrated, extremely hyperactive, or aggressive
    - May be used first-line or in addition to other medications
    - Worthy of consideration in pre-schoolers

Management

- Alternative medications, continued
  - Clonidine, continued
    - Start at 0.05 mg at bedtime and titrate up to 0.1 to 0.3 mg per day in divided doses
    - Sedation is main side-effect
    - Blood pressure may drop, rarely significant
    - May be administered as a pill or a transcutaneous patch

Management

- Controversial therapy
  - Diet
  - Herbal
  - Sensory integration
  - Chiropractic
  - Megavitamin
- All studied, none work, some dangerous

Management

- Duration of treatment
  - Highly individual
  - Stimulants continue to be efficatious into adolescence
  - Some (up to 30-70% in some recent studies) continue to benefit into adulthood
  - By middle school, a trial without medication should be considered yearly

Management

- Follow-up
  - Children on medication should be seen every 4 months
  - Children off medication should be seen once or twice a year
  - Visits should include height and weight (plotted on growth curve) and blood pressure

Management

- Special considerations
  - Mental retardation
  - Preschoolers
  - Adolescents

Conclusions & Questions